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MONTHLY REPORT

OFFICES OF FOREST EXPERIMENT STATIONS AND DENDROLOGY

December, 1923

FOREST EXPERIMENT STATIONS

Washington

During the month of December, Mr. Clapp made the rounds of the western Districts and experiment stations in order to lay the groundwork for the plans of the meeting to be held at Madison this coming March. He left Washington the end of November and returned very late in December, visiting first the Lake States Station and then proceeding around the western circuit, stopping off at each of the station headquarters.

Mr. Munns spent a short time visiting the Southern Station and the substations in Louisiana and Mississippi, and also paid a short visit to the Appalachian Forest Experiment Station.

The plans for the Madison meeting have been fairly well outlined and have taken up considerable time on the part of members in Washington. The meeting is working out into a very comprehensive and exhaustive one which will probably last two full weeks. In addition to the public requirements study, the meeting will also include a general discussion of investigative work in fire, yields, growth and experiment station activities.

Separate bills have been introduced in Congress for experiment stations in the Southwest, Florida, California, and the Northwest.

Practically the entire time of the Section of Forest Measurements has been taken up with the cooperative yield study of the southern pines. The work in the section was greatly cut into by the Christmas holiday period, the office force finally being reduced to two members.

The compilation of the volume tables for inclusion in a volume table handbook has proceeded rapidly, and most of the volume tables have been selected. Some work is still necessary in order to put these into shape for publication.

The Editor's Office

Citations

As mentioned in the November report, citations should generally be listed at the end of the article, alphabetically and numbered consecutively, with parenthetical references by number in the text. An exception is, of course, an instance of no more than two or three citations in the course of the article; here, a footnote to each seems the

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more sensible form to follow. But in either case, uniformity of style of citation is desirable. For our purposes the simplest and most useful seems to be to give the following information and in the order presented:

(a) Author's name, directory style, surname in caps, followed by given name, if used, in small letters. Period.
(b) Year published. Period.
(c) Exact title. Where matter cited forms a complete contribution to a publication bearing a different title, title of matter cited should come here, followed by "In Such-and-such publication" or by later reference to "Part X" of the entire publication.
(d) Source: i.e., name of book, periodical, bulletin, or, if book is being cited, name of publisher preceded by city in which published and colon.
(e) Volume and page numbers (inclusive) if from a periodical. Number of pages, if a separate, entire publication.

Three examples will serve to illustrate the above-outlined style:

1. BERRY, Swift. 1921. Value of young growth on cut-over land. Jour. Forestry, Vol. 19: 907-916.
2. FERNOW, B. E. 1902. Economics of forestry. New York: Thos. Y. Crowell & Co. 'p. 520.
3. THOM, C. C. and HOLTZ, H. F. 1917. Factors influencing the water requirements of plants. Wash. Agr. Expt. Sta. Bul. 146. p. 64.

Where it is desired to refer the reader to no more than certain few pages of the publication mentioned, this can be indicated by following the usual form with "See specifically pages 46-52" or by similar wording.

Tables

Economy of space in the make-up of tables, and the desirability of turning smaller tables into text have been mentioned here in a recent report. Three other features in the make-up of tables have come to the fore this month and may be mentioned as leading to better looking publications and easier reference for the reader.

Tables presenting similar data should, where possible, follow the same form. It may be that one table is quoted from another publication while the second is original, but this is not a good reason for presenting them in reverse form, or with other striking differences. Either the quoted table or the original one should be rearranged so that both are uniform.

Instances are observed of duplication of tables where a single slightly larger table would suffice. An example at hand is as follows:

TABLE 1 headings: Site No. - Area - Yield, virgin forest - Yield, second growth.
TABLE 2 headings: Site No. - Area - Yield, virgin forest - Stocking, virgin forest.

A combined table of five columns is here obviously more convenient for the reader and is certainly a sensible economy.

Table headings should be uniform as follows:

TABLE 17. *Direct damage to merchantable timber.*

That is, "Table" in caps; table number; period; title in italics.

Miscellaneous

Sheep and cattle are "grazers." Their owners are "graziers," technically speaking, whatever they may be called in certain branches of the Service. But "cattlemen" and "sheepmen" is good, honest English. The editor is not the first to urge for the use of lucid English rather than "Technese" in the writing of reports. Possibly not in forestry, but in every other profession 90 per cent at least of "technese" - the frequent use of technical jargon - is bluff. It is a variation of the old salesman trick of talking so fast that the listener cannot properly follow. It is gilt braid and brass buttons. On the other hand, technical terminology is as vital a thing as a delicate chronometer and no more appropriate for everyday, casual use.

Among several startling bits of information recently come upon are: "Early prospectors found themselves seriously hampered by reproduction." And in a retyped paragraph dealing with firebreaks: "These breaks are cleared by hand of all vegetation, but the prompt invasion of the cleared land by animals requires the recleaning of the breaks practically every year if they are to fulfill their purposes." But on reconsideration the blame for this deplorable state of affairs was transferred from the "animals" to "annuals."

DENDROLOGY

Mexican Timber Pines

The Chicago Lumber and Coal Company of St. Louis recently appealed to the Service for information as to what commercial pines their lands contained in the Sierra Madre, the purpose of the company being to exploit this timber for railway ties to be sold in the United States. Representative specimens of the company's pines were sent to Washington for examination and all proved to be of Pinus ponderosa arizonica, a

closely related form of our Western Yellow Pine. Small areas of this form occur in the mountains of southern Arizona, but apparently the tree has a much more extensive range southward in Sonora and Chihuahua, Mexico. If cut within our border the Arizona pine would probably be marketed with the true Western Yellow Pine, from which the wood differs in being heavier and harder. Wood of the Mexican-grown timber bears a rather remarkable superficial resemblance to some grades of longleaf pine. In order to determine for the Chicago Lumber and Coal Company the comparative physical properties of its timber, arrangements are being made for the Forest Products Laboratory to test short cross sections of ties sent in by the company. Mr. Betts has this work in charge.

Further Notes on Tree Maps for the Northeastern Experiment Station

Definite arrangements have been made to begin revising the Washington set of range maps of northeastern trees so that duplicates can be furnished to the station. These are to be sent out in small lots as rapidly as they are completed. It is hoped that the first installment will be ready within about a month.

Public Interest in Washington Street Trees

A local engineer, Mr. J. Rowland Bibbins, has applied to the Service for an informing statement regarding the growing conditions of Washington street trees. He is particularly interested in the treatment of such trees where street improvements have necessitated the widening of streets and the laying of wide cement walks. Such a statement has been prepared.

It is gratifying to know that the Forest Service has been asked to say something about the present condition of street trees. The Department of Street Trees and Parking here has for a good many years been in the habit of frequently consulting the Dendrologist regarding many of its tree problems, and cordial cooperation was always given in the matter of advice and by expert testimony in damage suits brought against the District in local courts.

Washington has an unusually large number of fine street trees, numbering in all some 105,000. Mistakes were made in the past by planting too short-lived trees and in setting them too close together. Some years ago this office advised the Street Tree Department to replace these short-lived trees with such rapid-growing species as Red Oak, Pin Oak, and Oriental Plane on wide streets and avenues, and to give them much wider spacing. Attention was also called to the inadequate open spaces provided for trees when wide cement walks were put down in place of the old brick pavements. While the latter suggestions were appreciated, it has not always been possible in business streets for the tree officials to bring the city engineers to appreciate the necessity of more growing space. There is need of revising the District's present attitude regarding the requirements of its street trees.

Appalachian

General

In December the two items of general interest were the visit of E. N. Munns and the preparation of the preliminary investigative memorandum. Munns' spent a week at the station, reviewing reports, talking plans, and making brief visits to various points accessible from Asheville at which studies are under way. Trips were made to the Biltmore Plantations, the fire damage sample plots near Old Fort, and the spruce type on the Black Mountains, where planting experiments (Fp-3) are being conducted. On Munns' departure Frothingham began the preparation of the investigative memorandum, which is being sent out to about twenty cooperators for comment.

Korstian spent four days at Cincinnati particularly for a conference with other members of the Publication Committee of the Naturalist's Guide which is to be published by the Ecological Society. While there he attended several of the sessions of the American Association, notably a symposium on the water relations of plants in which Livingston, Shull, Shantz, and J. Arthur Harris took part. Sap density came in for its share of discussion, together with other important phenomena. Incidentally, Korstian took advantage of an opportunity to confer with Messrs. Lyman and Giddings of the University of West Virginia concerning our investigative program and the question of establishing a center of work in West Virginia. Tentative arrangements had previously been made with these men for the beginning of investigative work in West Virginia next season.

L. H. Reineke, a student at the Department of Forestry, N. Y. State College of Agriculture, Cornell University, has been employed as a temporary assistant. At present McCarthy is keeping him busy on yellow poplar computations and graphs.

Yellow Poplar (TS-375)

Computation of taper tables for second growth poplar in Ohio and Virginia has been carried on by the form quotient method proposed by F. S. Baker. This may be characterized as an exact method when carefully applied. It promises to furnish new information on tree form and relation of crown ratio to the form of bole; and, with slight modifications, it is the right method of approach to the problem of universal volume tables.

It is more difficult to prepare an accurate taper table which will give average results for trees of different form by height and diameter classes than to prepare separate tables for specific form classes. The latter will probably be the ultimate method.

Fire Studies

A study of weather records during the fall fire season of 1923, when compared with the record of fire occurrence in western North Carolina and eastern Tennessee, again showed the influence of high atmospheric and low vapor pressures on forest dryness. The fall fire season of 1923 was brief and not as severe as that of 1922. Fire severity and weather conditions during these two periods were compared by McCarthy in his paper on "Forest Fires and Storm Movement."

Fort Valley

Research activities during the past month have been confined almost entirely to the office. The entire station force, excepting the caretaker, is now settled in the winter quarters in Flagstaff.

Krauch has been working on sample plot data and the revision of several reports. In the way of field work he made a number of borings to compare the acceleration of growth after cutting at 18 feet with that at 4½ feet above the ground. The cores show a slower rate of growth at 18 feet than at breast height, but nevertheless a very pronounced acceleration after cutting.

Pearson, in addition to preparing his annual report for the meeting of the District Investigative Committee and current duties, has found some time to work on his type study report.

A windstorm of unusual severity on December 9 and 10 wrought havoc in the timber in various parts of District 3. The section of virgin yellow pine at the Fort Valley Experiment Station suffered by far the worst windfall known to have occurred in that vicinity. An important factor in this case was the recent clear cutting of the northwest quarter owned by the Saginaw & Manistee Lumber Company. Enormous losses are reported for recently logged areas on the S & M sale north and west of Fort Valley. On cuttings five years or more old the damage generally has been less severe, although there are exceptions to this rule. Anxiety is felt regarding the condition of sample plots established by the experiment station. On account of the impassable condition of the roads an examination of these plots cannot be made until spring.

Fremont

December Activities

The single important field activity of December was 10 days work by Bates at the station in closing up the fifth series of tests in the soil study, T-5. This series involved a comparison of a number of D-3 soils collected in the fall of 1922, with a number from D-2, and also comparisons of the same soils with different amounts of water. The results as roughly summarized at present confirm the opinion obtained inferentially from previous tests, that with many soils better growth is produced at relatively low moisture contents. This final or closing work on the tests involves sampling the soil for nutrients, washing out the trees, measuring and photographing the roots and obtaining green and

dry weights. A considerable amount of data have now been accumulated, and a sixth series of tests is already under way, but it is not apparent just when the results can be made available.

On December 20 Bates met with Mr. Clapp in the office of the District Forester and a satisfactory conference on general research policies for the District was had. The outstanding problem in D-2 at this time is obtaining a proper balance between the exacting, time-consuming fundamental studies at the Experiment Station, and the broader studies, mainly along management lines, which the District is coming to need very badly. This conflict is, of course, especially severe because of the very great limitation of research activities by lack of funds. However, the matter appears to be working itself out very satisfactorily, due both to the appreciation by the administrative men of the District of the actual usable values of the fundamental studies, and their willingness to cooperate in every way to make the broader work possible under Research direction.

The most of the month was spent by both Roeser and Bates in summarizing data of a number of projects, at least roughly, as needed for the investigative program.

January Plans

Most of the month will be required for the annual summing up and gathering of loose ends. The meeting of the investigative committee will not be held until January 21, owing to the late start that was made in preparing for it.

It is expected that Roeser's summary of past work and plans for future work in the tree-breeding studies will be submitted during the month.

Bates will prepare a brief article on checking of erosion by willow planting.

Lake States

The plans for the development of the work of the Lake States Station progressed materially during December, owing in large part to the opportunity to discuss them with Mr. Clapp during his three-day visit. The outline of possible projects was discussed in some detail, although the narrowing of the list to those which will actually be undertaken the first year will have to be left until the Advisory Council has had a chance to pass upon them. The most promising places for the location of centers of work were also outlined. They are Cloquet and the Minnesota and Superior National Forests in Minnesota, Trout Lake in Wisconsin with supplementary work in the vicinity of Solon Springs, a point near Marquette in the hardwood belt of northern Michigan and Grayling and the Michigan National Forest in the lower peninsula. The plan for the formation of the Advisory Council was also discussed and tentatively approved by Mr. Clapp and forwarded to Washington for the Forester's approval.

A conference of the members of the staff, and including Hansen and Wiggin from Cloquet, was held to outline the development and coordination of the work in the jack pine growth and yield study. With the

plots secured this fall in southern Michigan, the data which has been secured by members of the Cloquet Station during the past few years and that which was taken in Hubbard County, Minnesota, by Chapman and has been worked up in Department of Agriculture Bulletin 820 make a good beginning for a comprehensive presentation for the region. These data should next be studied sufficiently to see if they are complete for the parts of the region represented. There will then remain the rock outcrop area of northeastern Minnesota and the jack pine sands of Wisconsin which may represent different growth conditions and in which further data should be secured. In both places, there will be excellent opportunities this winter to secure data in connection with cutting operations on the Minnesota National Forest and in connection with the operations of the Cornell Wood Products Company in Wisconsin. It is planned that R. E. Stevens of the Cloquet Station will go to the Minnesota National Forest and probably Wackerman will go to Wisconsin where it is expected that the State will furnish a man to cooperate.

Supervisor Dahlgren of the Minnesota National Forest visited the office during the month and the plans for work on the Minnesota this winter were discussed. He is particularly interested in the preparation of cordwood volume tables for aspen and paper birch. He feels that some additional measurements are also needed for white spruce. There will be an opportunity in connection with the Cloquet Lumber Company's operation near Ely to secure the measurements. The table for use on the National Forest should be based on utilization to three inches in the tops and five inches d.b.h. and show the volumes in double cords of eight-foot wood. Dahlgren expects that the scaler on the timber sale will be able to help with the work part of the time, and he plans to assign other rangers and scalers to the work one at a time for short periods to give them an idea of its character.

Since the work of the Cloquet Station is to be coordinated with that of the Lake States Station under the same direction, it is planned, beginning with January, to include in the monthly report a statement in regard to the Cloquet Station. Messrs. Hansen and Wiggin came to St. Paul early in the month, and Miss Myrtle Smith arrived just at the end of the month for the winter.

Several incidental jobs of more or less importance were also accomplished during the month. A statement in regard to farm woodlands as an asset in land appraisals of the Federal Land Bank of St. Paul was prepared and forwarded to Mr. J. A. Doelle, Vice President of that bank. Both he and Mr. E. F. Faast, another of the officers of the bank, are much interested in this subject. Zon has been active as a member of the program committee for the Tri-State Development Congress to be held at Duluth January 24 and 25. As the result of the interest of several members of the committee, including Deans Russell and Coffey, in forestry, that subject has been given a prominent place on the program. Almost the whole of the morning session of the first day will be devoted to forestry with three addresses on that subject. In the afternoon discussion of taxation, two of the addresses will be concerned with forest taxation. A plan is being worked out by which a series of seminars in forestry will be held weekly or bi-weekly at which members of the two Forest Experiment Stations, advanced students

in the Forest School, and members of the Botany Department of the University will be present. It has been suggested that the subject of the natural classification of vegetation in the Lake States be made the subject for discussion this winter. Different points of view will be brought out by foresters, ecologists, and botanists, and it is hoped that as a result a scheme of classification can be worked out which can be satisfactorily used by all these groups in referring to the vegetation types in the region.

Another possible location for a substation was called to our attention during the month by Mr. Doelle. It appears that land was donated near Dunbar, Michigan, for use as a site for a county agricultural high school. Some buildings were erected but the cost was apparently excessive and the county has now abandoned the idea and offered the site to the Michigan Agricultural College for a branch station. It is still under consideration by the State but, if they should not avail themselves of it, it might be available for a center for the Forest Experiment Station. It is located in the hardwood belt of the eastern part of the upper peninsula of Michigan.

An offer has been made to Marquette University to cooperate with them in working up some of their data on the swamp type in the upper peninsula, which has been secured during the past two or three seasons by a timber survey crew which has had the title, "Great Lakes Forest Survey."

Addresses have been made during the month before the University Farm School assembly, the Kiwanis Club of Minneapolis, the Engineers Society of St. Paul, and the Minnesota Section of the Society of American Foresters, the latter in connection with a very interesting discussion of swamp drainage. A statement was also prepared on a forestry program for Michigan for the Michigan State Grange, several members of which are interested in forestry.

Grossmann has been chiefly occupied during the month as a member of a board of review in going over the manuscript by Baker and Korstian, entitled "Climate, Soil and Native Vegetation of Brush Lands as Indicators of Planting Sites for Western Yellow Pine in the Intermountain Region."

Northeastern

December saw the close of field work on the spruce growth and yield study until next spring. As a result of a very open fall Westveld succeeded in continuing his work at Moosehead Lake until the 10th of the month, an unusually late date to be able to work to advantage in central Maine. He succeeded in securing a considerable amount of data as to the results of a recent operation for pulpwood, both as regards reproduction and the trees left after cutting. While the data have not yet been worked up, several things struck him as of particular interest as the work progressed. Contrary to popular impression, there seems to have been comparatively little windfall in the trees (chiefly white pine) left after logging and the increased diameter growth of these trees is striking. Spruce reproduction, while abundant, nearly all seems to have taken place prior to the cutting. Several interesting questions came up as to the relation between reproduction and ground cover which will undoubtedly require considerably more study, much of it of a fundamental nature.

During the month arrangements were perfected for adding H. B. Peirson, State Forest Entomologist of Maine, and his assistant, J. A. Beal, to the staff. This was made possible by having the funds contributed by private owners, by which the work has been financed, turned over to the Forest Service as a cooperative fund. The work will continue to be conducted chiefly in Maine, and to deal principally with the spruce bud worm. Under a cooperative arrangement with the Bureau of Entomology, the work will be under the technical direction of that bureau and under the administrative direction of the Forest Service. The work which Peirson is doing is of vital importance, and that it has been yielding results of real value is indicated by the fact that private owners have been willing to contribute more than $8,000 to provide for its continuance.

Meyer commenced office work on the spruce yield data which he and Behre collected during the field season. Peirson is also finding much of this material of value in connection with his studies of the spruce bud worm. In this connection a rather detailed criticism was submitted at his request to Dr. F. C. Craighead, Chief of the Division of Forest Entomology, on a manuscript dealing with bud worm damage, prepared by him as a result of his last season's work in Canada. Doctor Craighead's data prove clearly that the slower growing trees suffer more severely from the bud worm, but whether this is due to their slower growth or to their position in the stand and the habits of the insect, does not seem so clear.

Behre spent considerable time as a member of the Board of Review, appointed by the Washington office, in going over the manuscript by F. S. Baker, entitled "Construction of Taper Curves." This is a subject on which Behre had spent considerable time before joining the Forest Service. He is inclined to think that the formula method offers the simplest and most accurate method of taper curve construction so far devised. In addition to going over Baker's manuscript he also analyzed carefully a recent article by Major Wright, Director of the Canadian Forest Experiment Station at Petawawa. As a result of this analysis, he believes that Wright's data tend to prove the general applicability of the formula method, in spite of the latter's conclusion to the contrary.

Considerable progress has been made toward the organization of the Forest Research Council. Letters have been sent to some sixty organizations and individuals, explaining the plan in detail and asking for nominations. Many suggestions have been received and the replies indicate that the central idea of the council meets with unanimous approval. Nearly 300 letters have also been distributed to various organizations and individuals asking for information as to forest investigations already under way, and for suggestions both as to problems in need of investigation, either by the station or other agencies, and as to possible sites for substations. These letters are now being followed up by personal visits of members of the staff to those organizations that are actively engaged in forest research. In addition to eliciting information and suggestions of value, it is believed that this census will be helpful in disseminating information regarding the objects, activities, and plans of the Experiment Station.

Priest River

The work of the station during December was confined almost entirely to the office. Three members of the staff spent some time preparing material for the meeting of the District Investigative Committee which is being held earlier than usual this year. Assistant Forester Clapp was a welcome visitor for two days early in the month. The work and plans of the station were gone over very thoroughly in the office, but the visit was too short for field inspection. Weidman and Gisborne attended the annual meeting of the Western Forestry and Conservation Association at Seattle December 13 and 14.

The Seattle meeting was an interesting one from the standpoint of public requirements. The program contained a symposium on this subject for the California region and for the white pine, yellow pine, and Douglas fir regions of the Northwest. The topic for each region was the same - that is, what forestry steps are practicable for continuous production after logging at the present time. Two papers were presented for each region, one by a forest officer, giving the Federal forester's proposals, and the other by a private forester, giving the private forester's proposals. The private foresters were employed either directly by lumber companies or in an advisory capacity. The most striking and encouraging feature of this symposium was the almost uniform agreement of the Federal and private foresters. This is especially interesting in view of the belief that the program was arranged in this way to bring out differences. Without weakening their case at all, the Government foresters presented their subject in a practical and convincing way, notably free from the sort of professional bias which the industry perhaps expected. The presentation seemed to make a good impression on the lumbermen and timberland owners.

The chief activity of Larsen during the month was in working up his field work on the reproduction-after-fires study. In addition, he spent some time in preparing material for the District Investigative meeting, as well as giving some attention to correspondence and reviewing the galley proof of the Department circular on slash disposal in the white pine type.

Most of Gisborne's time was spent on compilation of records in connection with the study on relation of lightning to forest fires. Some time was given to checking the duff hygrometers, and also to some work in cooperation with the District officer in charge of fire protection. In addition to the paper presented at the Seattle meeting of the Western Forestry and Conservation Association, Gisborne had a paper entitled "The Importance of Duff Moisture Content in the Forest Fire Problem" on the program of the annual meeting of the Society of American Foresters at Baltimore, December 27.

At Savenac Nursery Wahlenberg's efforts were devoted to compilation of field data and preparation of material for the District Investigative meeting. Some time was also given to seed testing work in the greenhouse.

Except for a week's leave and occasional assistance in office work, Haig was occupied steadily with the compilation of white pine yield data resulting from about six months' field work on this project.

At the Experiment Station Kempff was, as usual, busily engaged on a variety of work. He had a crew at work on the permanent fire line until December 20. This fire line is to follow closely the south boundary of the experimental forest for several miles. It is to be a chain wide, with all but the largest trees felled, and all slash and debris burned; and is to contain a tread to mineral soil in the center. Nearly a mile of this fire line was completed this fall. In addition, Kempff spent considerable time on scaling and timber sale supervision for the two small sales now in progress. Several days also were occupied with field work on a seed storage experiment. Improvement work around the station received some attention as there was time available for it between other jobs.

Southern

General

The isolation of the men at the substations was somewhat relieved during the month by the visit of Munns and Forbes at Urania, and of Munns, Wyman and Forbes at McNeill.

In anticipation of our Investigative Program for 1924 we consulted by mail with the State Foresters of Virginia, North Carolina, Louisiana, and Texas, with the District Forester, and the Supervisors of the Arkansas and Florida Forests, asking them to comment on our past work and suggest any new lines of future work. The Director also conferred with the secretaries of the Southern Cypress Association, the Southern Pine Association, and the Turpentine and Rosin Producers' Association along the same lines. No attempt was made to consult the southern lumbermen because of the difficulty of framing a letter which would ask for suggestions as to future work and at the same time make plain that our financial situation forbade our undertaking anything new. The man in charge of each substation was requested to submit a summary of the year's work.

During the month Miss Spuhler found time to go over our entire report file and bring the numbering into conformity with the latest revision of the library classification scheme. She brought up to date in the same way our numbering of books and bulletins in the library and made a start on a card index for them. She also accomplished a more convenient arrangement of our various forms.

Mention was omitted in the November report of the final signing of the Urania lease on 1,500 acres by the Assistant Secretary. A similar lease, on 200 acres at Bogalusa, was put in legal shape in Washington during the month and returned to the Great Southern Lumber Company.

Hadley called on the manager of the Rosa Lumber Company, Picayune, Mississippi, and secured a contribution of $110 to the cost of our pasture fence at McNeill. The fence had been paid for out of our regular funds, but the redemption of this pledge enables us to make a very necessary change in the pasture fence.

Wyman completed his revision of an excellent article for the agricultural and lumber trade papers on the year's work at Starke.

Before leaving New Orleans Mr. Wyman straightened out our herbarium, many specimens in which had been mounted by Forest Assistant Miller and had never been submitted for identification.

In addition to casual visitors, a representative of Arthur D. Little, Inc., was an interesting caller. We were able to give him a wide variety of information on both forest and economic conditions in our territory.

Protection

Fires.--Mr. Munns' experience gave particular value to his visit with us, and our fire projects have greatly profited. A strip survey which he and the station men ran through a forty-year-old stand of oldfield pine at Urania, which had suffered severely from a summer fire seven years ago, opened our eyes to the extent to which trees may be severely scarred without showing the injury superficially. As in our brush disposal study, loblolly pine proved to be more fire resistant than shortleaf on this tract. We are now endeavoring to devise a satisfactory method of making extensive fire studies to supplement our permanent plots. The main difficulty is in isolating the effect of any one fire in a region which is ordinarily burned over every year.

With the help of a laborer supplied by Mr. Hardtner, Hine made many check measurements of the height of trees in his fire plots, and secured additional data on crown, length, etc. Hadley submitted his report on the establishment of the fire plots in longleaf pine seedlings and saplings, which was reviewed by the Director and returned for minor corrections.

Munns went over the greater part of Forbes' general article on fires in the Coastal Plain, and now that its scope and purpose is clearly defined it will require only minor editing before distribution in mimeographed form.

Grazing.--As a result of prolonged argument on the ground, Wyman, Hadley and the Director worked out what appears to be a satisfactory plan for recording forest conditions in our "Tate Lease" at McNeill. Strip surveys, covering .3 of 1% of the area were run across the two 160-acre pastures, and on these strips all longleaf pine seedlings above 3 or 4 years of age were tallied. Three densities of reproduction were recognized, as follows: unsatisfactory, up to 400 seedlings per acre; satisfactory, 400 to 800 seedlings; good, over 800 seedlings. The seedlings were recorded by heights as follows: 1" to 2'; 2' to 5'; 5' to 10'; over 10'. The first class embraces the great bulk of seedlings likely to be killed by a single winter fire. Hardwood brush was

also recorded, because of its probable effect on both pine reproduction and grazing. Thirty quadrats, 6.6 x 66', were laid out at regular intervals along the strips, except where they fell in "baygalls" (hardwood draws). Hadley, with some help from Agronomist Reed of the Coastal Plain Experiment Station, later completed the staking of most of these quadrats, and made a good start on mapping them. The quadrat maps will show all seedlings over a year old, together with the ground cover, high shade, etc. These quadrats will be reexamined annually and will supply detailed data as to grazing injury to seedlings,and changes in vegetation due to fire or protection, and grazing. A number of quadrats will later be established in two ten-acre check plots, one burned annually and the other protected, both of which will be fenced against all grazing. Partly as a result of the reproduction counts, which checked earlier estimates of the area of each pasture which is included in baygalls or is covered by reproduction heavy enough to affect grazing seriously, it was decided to change the location of the fence between the two 160-acre pastures, one of which will be burned annually, and the other protected. Although this means the abandonment of the results on one whole grazing season, both Superintendent Greene of the Coastal Plain Experiment Station and our own staff are convinced that better results will be secured in the long run. The pastures as originally laid out vary too widely in the amount of reproduction present and area of other than pine land to be thoroughly comparable. Agronomist Reed has already done some work on the examination of the forage within the pasture, and may decide to use somewhat similar methods to our own for recording grazing conditions.

Measurements

Forbes revised his outline for the pine growth study bulletin.

It is proposed to submit the tupelo growth figures collected by Hadley and Hine last year for publication as a circular. Hadley has been working up the outline for this publication, and putting final touches on the actual data.

Management

Wyman continued his revision of the Urania brush disposal report. The Director gave Hine's Mr-1, Urania, report a final review and returned it to him for completion.

Hine made considerable progress on the maps of both plots and quadrats for the various reproduction studies at Urania, dealing with longleaf, shortleaf and loblolly as separate species.

Naval Stores

Wyman began work while in New Orleans on his combined report on the establishment of the naval stores projects at Starke, and the work of the year. He stopped off on the Florida National Forest on his way back to Starke before Christmas, and conferred with Supervisor Hill and Deputy Supervisor McKee. While at Camp Pinchot he secured copies of significant cost-keeping figures on the Graham Lease.

Forestation

Hadley prepared two sets of pine seed of all four important species for germination tests which will be undertaken by the Oklahoma A. & M. College and the Mississippi A. & M. At Stillwater, Professor Christian Jensen, a Biltmore graduate and head of the newly-established forestry department, will supervise the tests, and at Starkville the tests will be personally conducted by Dr. Pessin, a Georgia forester who specialized in botany and ecology at Johns Hopkins. The seeds to be tested include our regular stock and some special collections made by the Great Southern Lumber Company at intervals during the fall.

In addition to his regular December sowings at Bogalusa, Hadley tried out the value of burlap bags as a mulch on two beds at McNeill. The McNeill nursery will be used largely for quantity production, the careful observations being made at Bogalusa. Hadley made arrangements with the Great Southern Lumber Company whereby a number of our tests will be made by Great Southern labor under Hadley's supervision. This will permit of larger scale production without increasing the time required for detailed record. Hadley surveyed and mapped the McNeill plantations of the past two years. The Director reviewed Hadley's reports on the establishment of all of his plantations, both at McNeill and Bogalusa, and returned them to Hadley.

Hine surveyed and mapped the Urania plantations of last fall and winter and made preparations for the seasonal plantations this year. Unfortunately, Hadley found that the nursery stock of loblolly had been so badly depleted by various agencies, among them serious bud worm infestation, that he did not have sufficient seedlings with which to supply Hine's needs. Owing to the nurseryman's error in sending us loblolly seed in place of shortleaf, our supply of shortleaf seedlings was even scantier than the loblolly. With the seed beds at Bogalusa, where they will have ~~xxxxxxx~~ his close supervision, Hadley figures on an adequate stock next year.

Wind River

Hofmann attended the Western Forestry and Conservation Association meeting at Seattle, Wash., Dec. 13 and 14, and presented a paper on "The Application of Relative Humidity to Forest Fire Prevention and Control."

Considerable time was given to the investigative program for the District Investigative Committee meeting.

Aside from routine, the remainder of the time was spent in the compilation of Fire Study data.

In order to correlate the investigative work with the other offices, Hofmann moved to Portland late in December.

Simson's entire time, with the exception of routine, has been given to the compilation of Fire Study data. He will spend the winter at the Experiment Station to continue the meteorological records and compile data.

District 5

The month of December has been spent chiefly on office work by both Dunning and Show, both men having taken some annual leave besides. Show represented the District at the annual meeting of the Western Forestry and Conservation Association held in Seattle December 13 and 14. The meeting was a most interesting one and was largely attended by both foresters and lumbermen. Several research men were present from other Districts - Hoffman, Weidman and Gisborne all having papers on the program. One of the two major subjects for discussion was the Public Requirements study. For each region, one of the Forest Service men who had been identified with the study presented the preliminary conclusions and he was followed by a forester, employed by lumber companies or by lumber associations, who discussed the proposition from the viewpoint of the private owner. Pretty much the same plan was followed as at the San Francisco meeting of the association two years ago, at which time the general reaction of the lumbermen was one of attempting to discredit or combat the conclusions of the Federal foresters. At the meeting this year the reaction was altogether different, and in each case the representatives of the private interests discussed frankly and impartially the questions of technique raised by the Forest Service men. In most of the regions differences between the two interests were relatively slight and if the statements of private owners made at the meeting are to be taken at face value, a great deal of progress has been made on this important study during the past few years.

Show met Assistant Forester Clapp at Portland and discussed the work of the District on the way back to San Francisco. Show completed the regional public requirements report for the coast redwood region of California. This region, important as it is, has probably been less studied than any in the United States, so that thoroughly reliable data are remarkably scanty. As most of the important facts are readily discernible, it is felt that the conclusions reached will be justified when more authentic information is secured.

Lumberman Goldsmith of the Shasta Forest continued on detail in the Office of Research during the entire month. His time was spent in analyzing the material on lightning storms, which he has put in excellent shape for further study. So far it appears that general storms are rather more frequent than has been thought, and that these general storms instead of originating from a single storm center and spreading with regularity along a well-defined path, really are a series of practically simultaneous local storms. A very hasty examination of the daily weather maps does not show any particularly well-defined type of map characteristic of the storm. It is too early to say that they can be predicted from the data now available to the Weather Bureau, but in all probability a large percentage of our storms are unpredictable. The study will be continued by Show and Kotok.

Dunning's time was spent almost entirely in working on the second remeasurement of a series of eight permanent methods of cutting plots located on the Plumas Forest. It has been necessary to recompute part of the results of the first remeasurement and as yet the important results of the second remeasurement have not become evident.

Show, as Secretary of the District Investigative Committee, spent some time in lining up the plans for the annual meeting. A memorandum of the work of the Office of Research was prepared and is now being circulated, and other offices doing research work are also putting the material in shape for members of the committee. The meeting this year will be attended by the usual representation from the District office, and in addition Mr. John Miller of the Bureau of Entomology and Professor Donald Bruce of the University of California Forest School have been invited to attend. Both of these men have accepted the invitation. Supervisor Wulff of the Stanislaus will also be present.

Library

Last month the Library loaned 794 books and periodicals and 93 members of the Service and others consulted the Library in person. There were 254 books and articles indexed for the card catalogue during the month.

Manuscript News Notes

Lake States

The Forest Redemption of Michigan. A. E. Wackerman (to Lumber World Review).

Cutting Operations of the Ford Company. J. A. Mitchell (to American Lumberman).

Lake States Forest Experiment Station and the Mining Industry. J. A. Mitchell (Proceedings Lake Superior Mining Institute).

Fremont

Relative Resistance of Tree Seedlings to Heat. C. G. Bates and J. Roeser. (Dept. Circular - to printer).

Appalachian

Forest Fires and Storm Movement. E. F. McCarthy (Society of American Foresters - to Journal of Forestry).

Some Ecological Effects of Shading Coniferous Nursery Stock. C. F. Korstian (to American Association for the Advancement of Science - for Ecology).

District 4

Forest Planting in the Intermountain Region. F. S. Baker and C. F. Korstian. (Dept. Bulletin - to printer)

District 5

Public Requirements Study in the California Pine Region. S. B. Show. (to Timberman)

Wind River

Why Forest Fires Burn. J. V. Hofmann. (Radio of Portland Oregonian)

Priest River

Importance of Duff Moisture Content in the Forest Fire Problem. H. T. Gisborne. (Society of American Foresters - to Journal of Forestry, 1923)

Influence of Forest Cover on Streamflow. H. T. Gisborne. (Mont. Irrigation and Drainage Inst., Missoula, Nov. 20, 1923)

Moisture Content of Fuels as an Index of Fire Danger. H. T. Gisborne (Western Forestry and Conservation Ass'n)

What Steps are Practicable in Logging Western Yellow Pine in the Northwest. R. H. Weidman. (Western Forestry and Conservation Association)

Appraisal of Forest Fire Damages. H. R. Flint. (to Journal of Forestry)

In Print

Planting in the National Forests. C. G. Bates. (Fremont) Scientific Monthly, December, 1923. p. 609-618.

Lightning and Forest Fires in California. S. B. Show (D-5). Timberman, October, 1923. p. 152.

Weather Forecasts Aid in Forest Fire Control. H. R. Flint (Priest River). Timberman, November, 1923. p. 204-205.

The Forester's Goal. R. Zon. (Lake States) The Gopher Peavey.

High Lead and Reproduction in Pine Stand. E. N. Munns (D-5) Timberman, November, 1923. p. 172-174.

Relative Humidity and Forest Fire Prevention. J. V. Hofmann (Wind River) Timberman, November, 1923. p. 56-57.

Significance of a 255-year Age Class in an Eastern Kentucky Forest. F. W. Haasis, Journal of Forestry, November, 1923. p. 700-704.

Notes on the Composition of Even-Aged Stands. F. S. Baker (D-4). Journal of Forestry, November, 1923. p. 712-717.

Use of Fertilizers in a Coniferous Nursery. T. S. Hansen. (Cloquet) Journal of Forestry. November, 1923. p. 732-735.

Land Reclamation Begun in Michigan. J. A. Mitchell. (Lake States) St. Paul Dispatch, December 12, 1923, and The Pine Knot, Cloquet, Minn. December 14, 1923.